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SUSTAINABLE ENERGY
AND ENVIRONMENTAL
ENGINEERING

**Details for follow-up activities: Solar Water Heater
Recommendation**

Installation & Labour

The installation of a solar water heater will require both solar technicians, plumbers, and electricians. It most commonly costs \$2,000-\$4,000 to install the system and position the collectors. Solar contractors historically charge approximately \$70 per hour. If it is decided to have a plumber install pipes for the storage tank, then it will cost approximately \$45-\$65 per hour for the plumbing services [1].

Implementation Schedule

There are several scheduling factors that has influence project duration:

- **Site Visit:** A site visit must be conducted by the expert for taking measurements, generating quotes, etc. After site visit, the engineer may take up to 2 weeks to decide the direction of panels, wiring schematics, and panel choice.
- **Permits:** The permissions with local bodies and checking with the permissible building codes for the respective state should be completed.
- **Installation:** Installation historically can consume 5-7 days.

Overall, the implementation of solar panels from start to finish will take approximately 3 weeks, disregarding the time to obtain permits.

Maintenance

Once installed, the solar water heating system requires regular inspections to ensure that all components are functioning properly. This includes inspecting for cracks, loose bolts, or removal of accumulated debris. Visual inspections may be conducted by the owner, but it is generally recommended that a solar maintenance professional performs a maintenance check every three years. These technicians historically charge approximately \$70 per hour. An acidic solution must be circulated through the collectors and pipes every three to five years to prevent corrosion and debris build-up. An average of \$200 to \$300 of maintenance is approximated per annum.

Energy Saving Cost

Assuming it takes 4.40 kWh to heat one gallon of water by 1°C, and assuming one MMBTU of natural gas contains about 310.5 kWh of energy:

$$\text{Natural gas used yearly} = 8,769 \text{ MMBTU}$$

$$\text{Yearly cost to heat water} = \$4.20 * 8,769 \text{ MMBTU} = \mathbf{\$36,829}$$

Department of Energy recommends [2]

Before purchasing and installing a solar water heating system, it is recommended to perform the following tasks:

- Estimate the cost and energy efficiency of a solar water heating system

- Evaluate your site's solar resource
- Determine the correct system size
- Investigate local codes, covenants, and regulations

The average life expectancy of certified solar water heating systems is 20 years [3].

Success Stories

Sunbandit is a distributor of renewable energy systems that provide simple, clean, and dependable energy to homes and businesses. Success stories from their products can be seen [here](#).

Carbon Diet provides solutions and tips for individuals looking to implement green solutions to their homes or businesses. They have many success stories on their website, [here](#).

Solar Water Heaters Suppliers

Brand	Price	Gallon	Website
Sunbank	\$2,400.00	40	Here
Duda	\$8,178.39	211	Here
Duda Diesel	\$8,758.92	264	Here
Sun Earth Inc	Call for Quote	-	Here
Apricus	Call for Quote	-	Here
Superior Solar	Call for Quote	-	Here
Hot Water	Call for Quote	-	Here

All of the above solar water heater suppliers are service based companies. The providers will ask for the user's requirements, and follow up with pricing quotes and services as mentioned below:

- 1: Free Site visit and requirement gathering.
- 2: Give quotation according to requirement
- 3: The quotation usually includes installation charges and labour
- 4: And the schedule or duration of time to install
- 5: Few companies include 1 term or 1 year of free servicing or maintenance.

Technicians

Company	Location	Phon	Website
Progressive Service	Durham & Raleigh, NC	877-325-0180	Here
Sears Home Services	Greenville, NC	252-360-4222	Here

B&J Plumbing	Wilson, NC	252-237-5578	Here
Ricky Wayne Plumbing	New Bern, NC	252-259-5694	Here
Quality Plumbing Heating Co.	Goldsboro, NC	919-735-4981	Here

References

- [1] “Cost to Install a Solar Water Heater | Solar Water Heater Cost.” [Online]. Available: <https://www.fixr.com/costs/solar-water-heater-installation>. [Accessed: 20-Mar-2020].
- [2] “Planning a Home Solar Electric System | Department of Energy.” [Online]. Available: <https://www.energy.gov/energysaver/planning-home-solar-electric-system>. [Accessed: 20-Mar-2020].
- [3] “Save Money and More with ENERGY STAR Qualified Solar Water Heaters | Products | ENERGY STAR.” [Online]. Available: https://www.energystar.gov/products/water_heaters/water_heater_solar/benefits_savings. [Accessed: 20-Mar-2020].